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ABSTRACT

This curriculum packet about maps, with seven accompanying lessons, is appropriate for students in grades K-3. Students learn basic concepts for visualizing objects from different perspectives and how to understand and use maps. Lessons in the packet center on a story about a little girl, Nikki, who rides in a hot-air balloon that gives her, and the students, different views of a park. The packet includes a teaching poster, seven step-by-step lessons plans, a picture of a hot-air balloon, two reproducible activity sheets, and 15 reproducible black-and-white sections of the park map. The lessons are (1) view from the ground (helps students think about how they view the world and the perspective with which they are most familiar); (2) view from a higher point (provides an opportunity for students to think about how objects change depending on the viewing perspective); (3) view from overhead (introduces the concept of maps and helps students understand the overhead view presented by maps); (4) symbols and legends (helps students become familiar with the concept of symbols and how to use a legend); (5) learning directions on a map (helps students think about direction and relative location); (6) map grids (helps develop skills students need to identify where things are on the Earth's surface); and (7) map scale (introduces students to the concept of measuring distances on a map and measuring the sizes of objects). (BT)

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ED 448 098

Map Adventures.

Geological Survey (Dept. of Interior), Reston, Va.

SO 032 344

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Teacher Information · Map Adventures

Introduction

- Map Adventures, with seven accompanying lessons, is appropriate for grades K-3. Students will learn basic concepts for visualizing objects from different perspectives and how to understand and use maps.
- The lessons center on a story about a little girl named Nikki. Nikki goes up in an unplanned balloon ride that gives her, and the students, different views of a park.
- Included in this package are:

  A teaching poster.

  Seven step-by-step lesson plans.

  A picture of a hot-air balloon.

  Two reproducible activity sheets.

  Fifteen reproducible black-and-white sections of the park map.

About the poster

- The poster in this teaching package shows different views of the same place (a park) from different perspectives. It includes three illustrations of the park: a ground view, a view from a higher point, and an overhead view. Each illustration has a box that tells part of a story about an adventure a little girl has in the park.
- The illustration will help your students move from visualizing objects from the most familiar perspective (a ground view) to the overhead view represented by most maps. This is the most basic and necessary skill in helping students understand and use maps.
- The lesson plans also introduce the concept of how symbols are used on maps to represent objects or features. It is not possible to show everything about a place on one map and still make it easy to read and understand. So mapmakers use symbols for many different kinds of features or objects. Another key point is learning to use map legends.

What's included in the lessons?

- **Lesson 1 · View from the Ground**
  Helps students think about how they view the world and the perspective with which they are most familiar. The lesson also introduces the students to a little girl named Nikki, who goes up in an unplanned balloon ride.
- **Lesson 2 · View from a Higher Point**
  Provides an opportunity for the students to think about how objects change in appearance depending on the perspective from which they are viewed.
- **Lesson 3 · View from Overhead**
  Introduces the concept of maps and helps students understand the overhead view presented by most maps.

Map Adventures Teacher Information is continued on the reverse.

What's included in the lessons?

- **Lesson 4 · Symbols and Legends**
  Helps students become familiar with the concept of symbols and how to use a legend.

- **Lesson 5 · Learning Directions on a Map**
  Helps students think about direction and relative location. It helps students realize that it is possible to describe the relationship of what direction one place is from another.

- **Lesson 6 · Map Grids**
  Helps develop skills students need to understand absolute location–where things are on the Earth's surface.

- **Lesson 7 · Map Scale**
  Introduces students to the concept of measuring distances on a map and measuring the size of objects.

To obtain copies of this packet and other U.S. Geological Survey (USGS) educational materials, call 1-800-USA-MAPS or write or visit a USGS Earth Science Information Center.

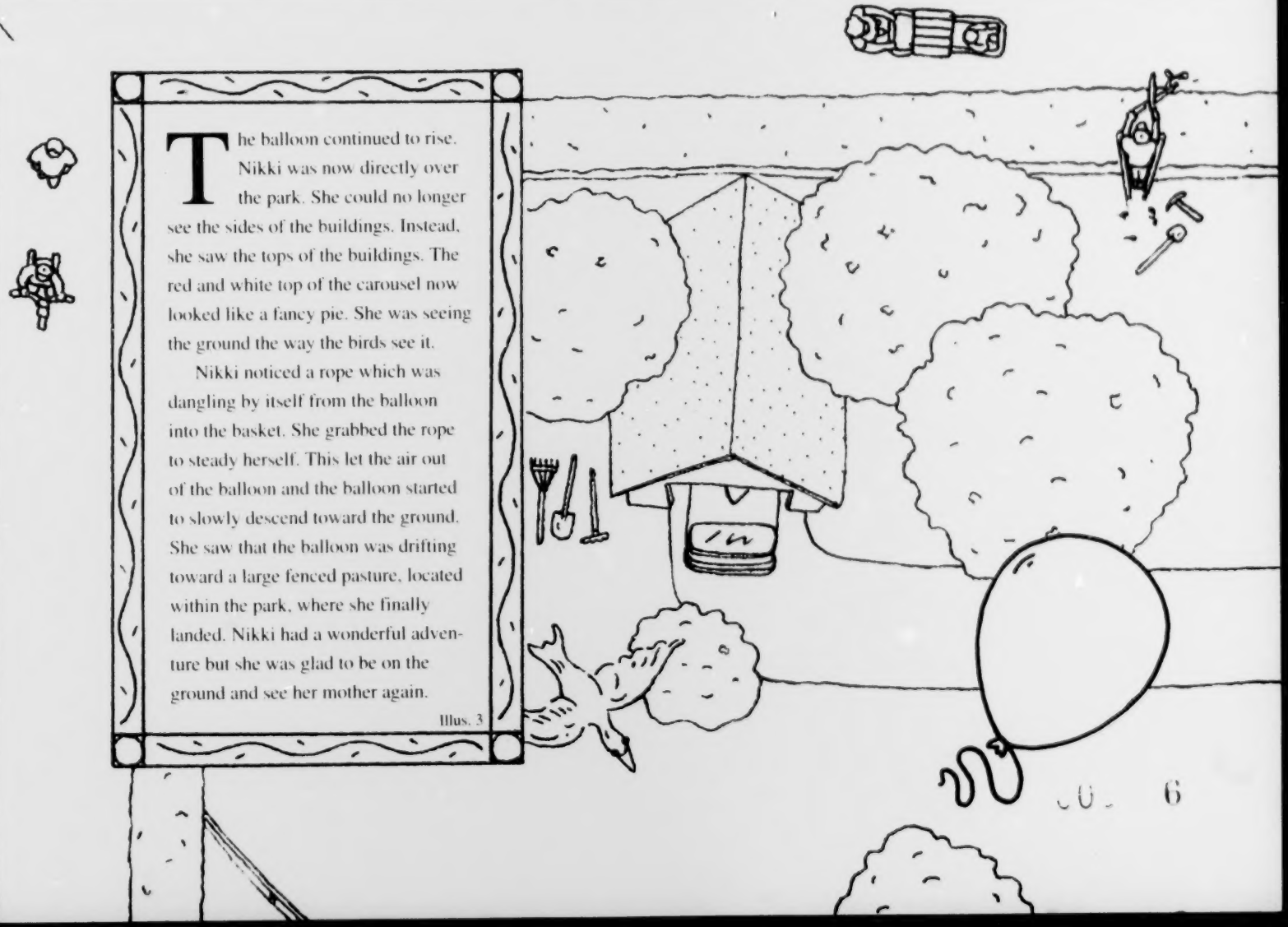
A

1

The balloon continued to rise. Nikki was now directly over the park. She could no longer see the sides of the buildings. Instead, she saw the tops of the buildings. The red and white top of the carousel now looked like a fancy pie. She was seeing the ground the way the birds see it.

Nikki noticed a rope which was dangling by itself from the balloon into the basket. She grabbed the rope to steady herself. This let the air out of the balloon and the balloon started to slowly descend toward the ground. She saw that the balloon was drifting toward a large fenced pasture, located within the park, where she finally landed. Nikki had a wonderful adventure but she was glad to be on the ground and see her mother again.

Illus. 3



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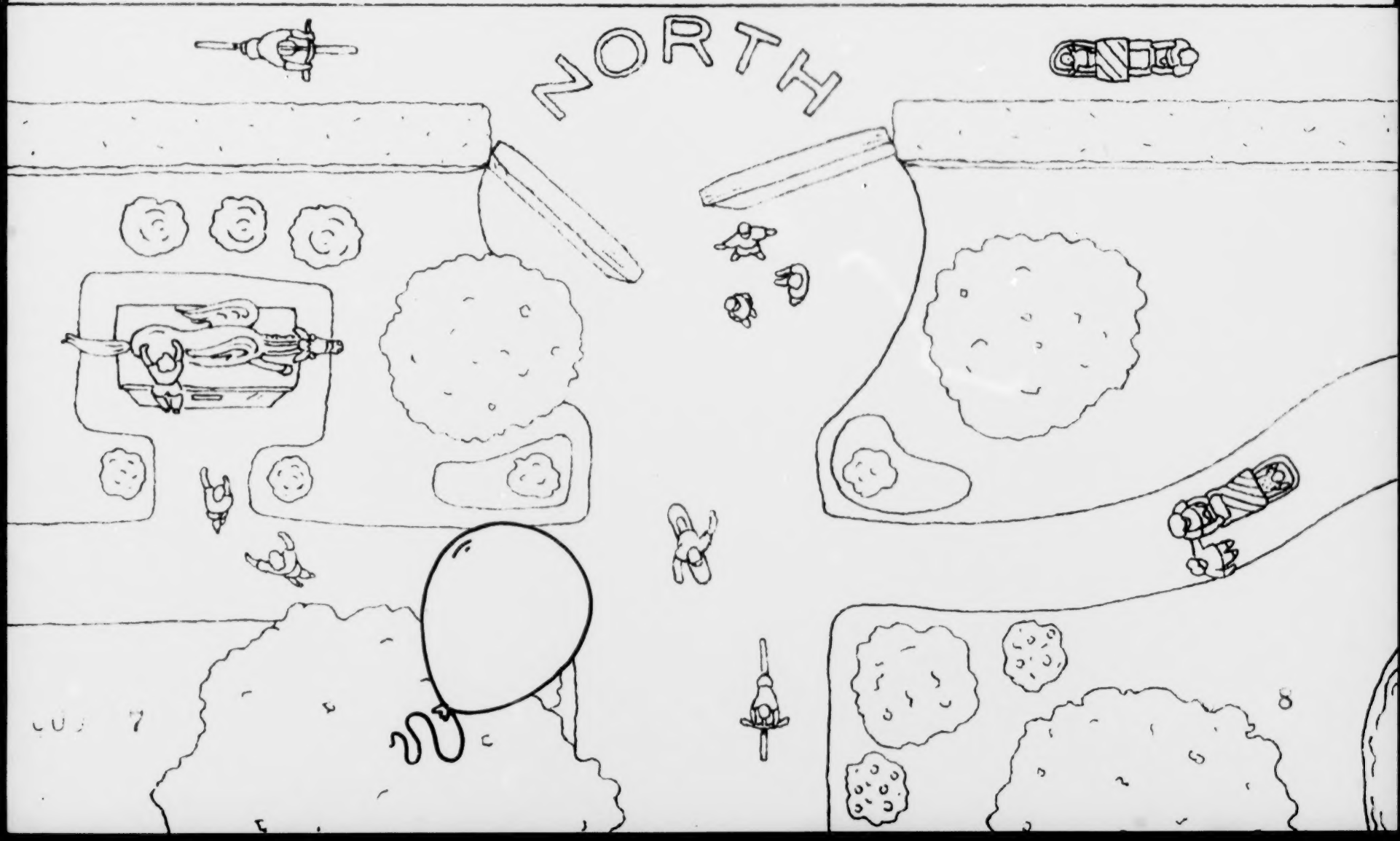

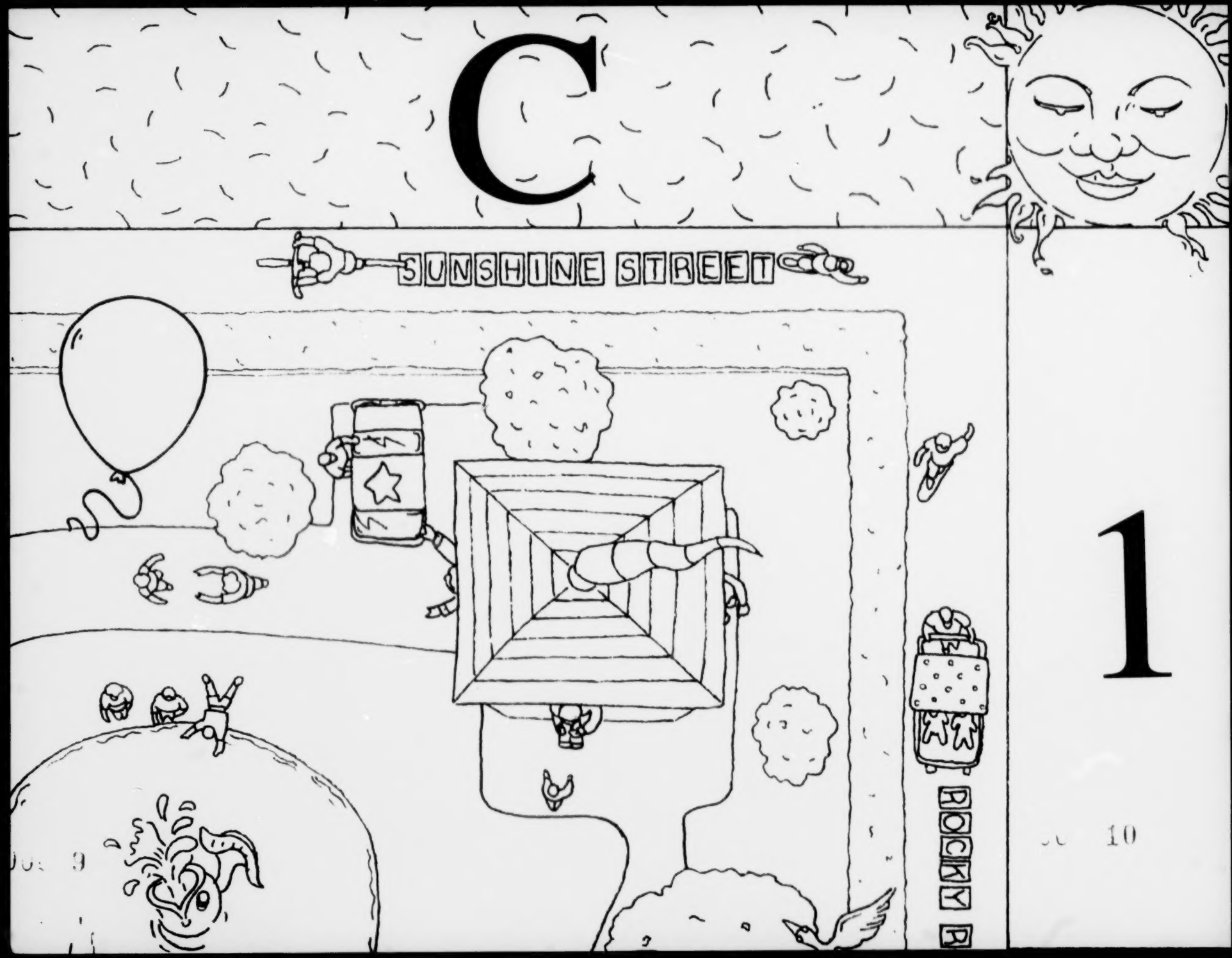
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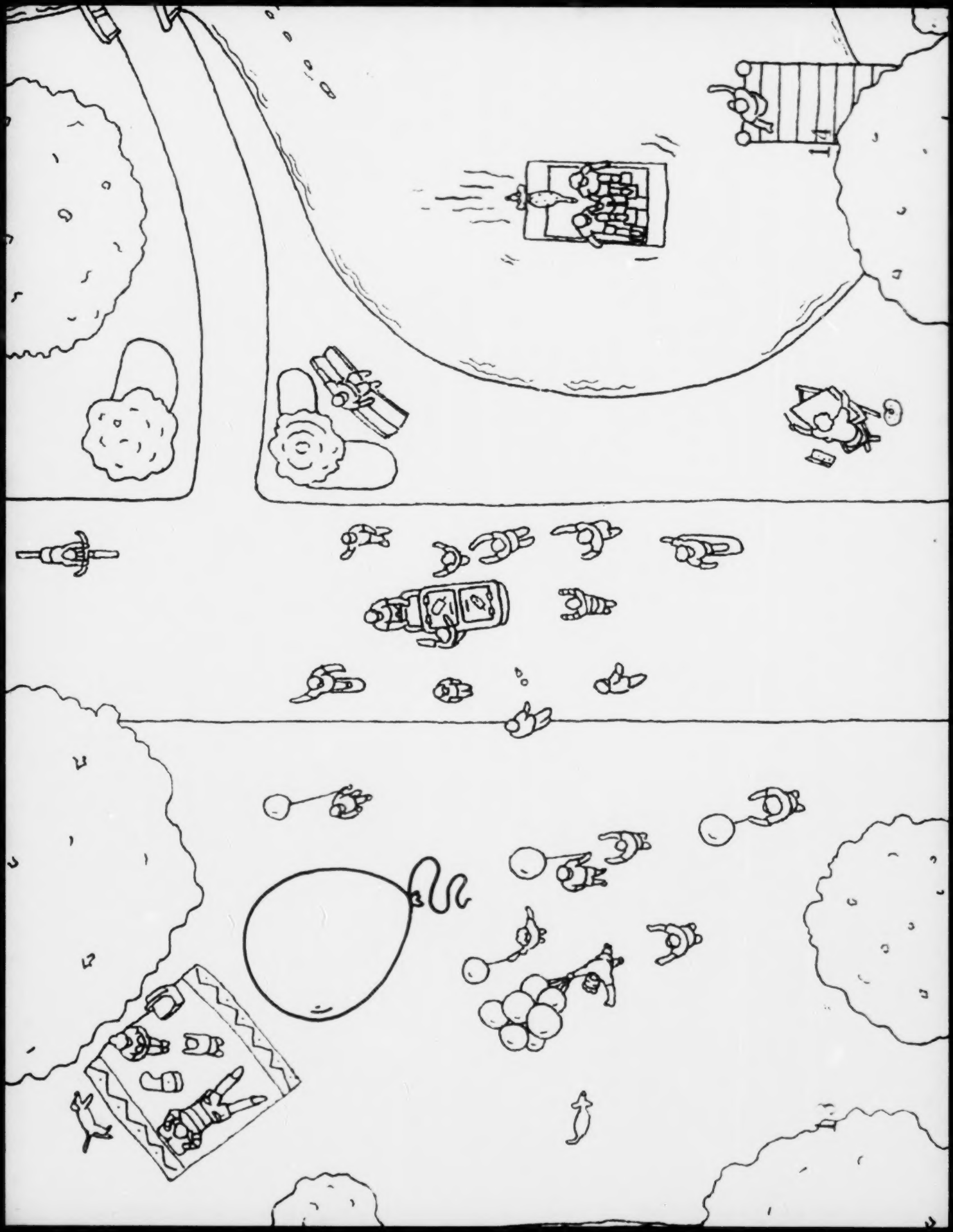

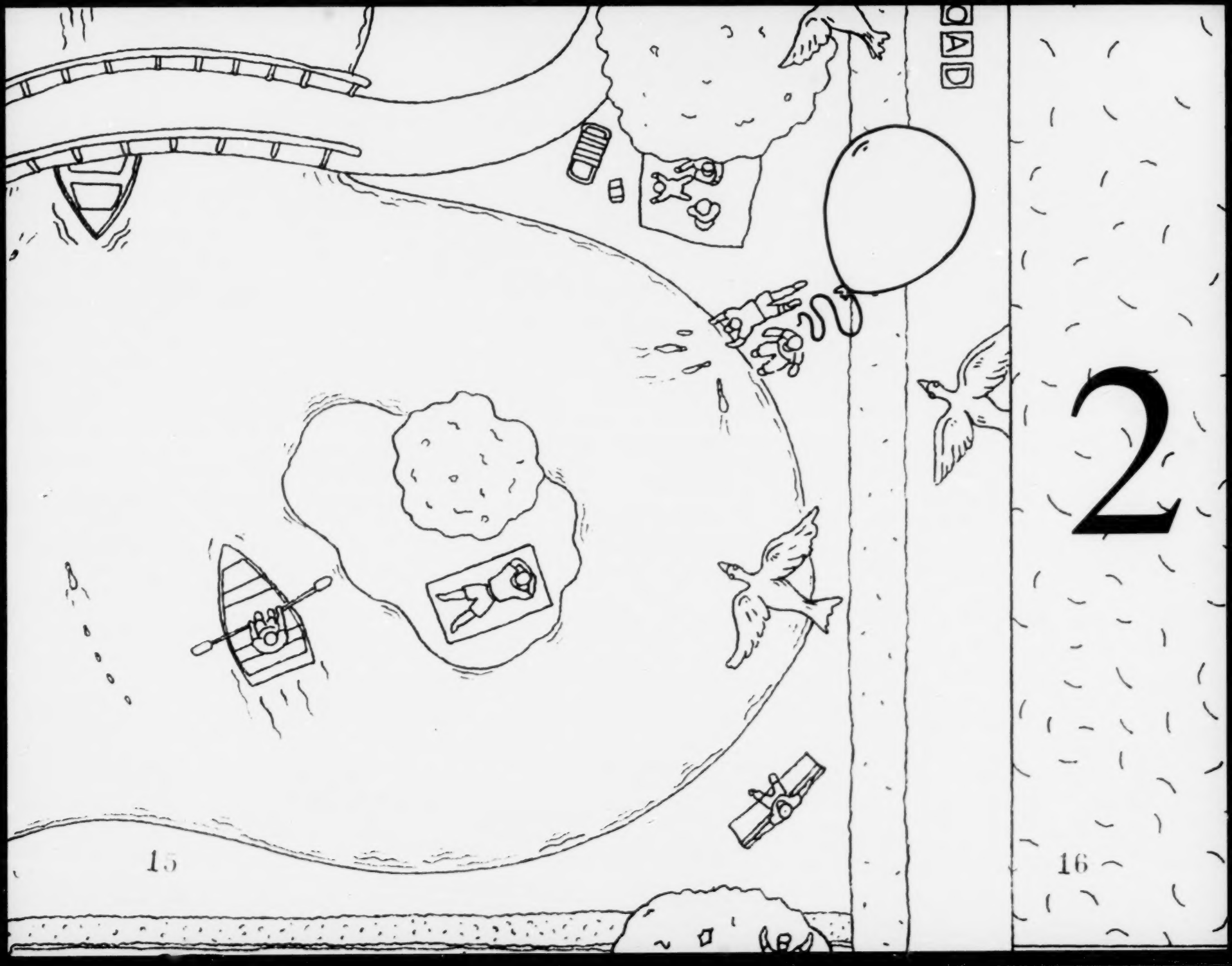
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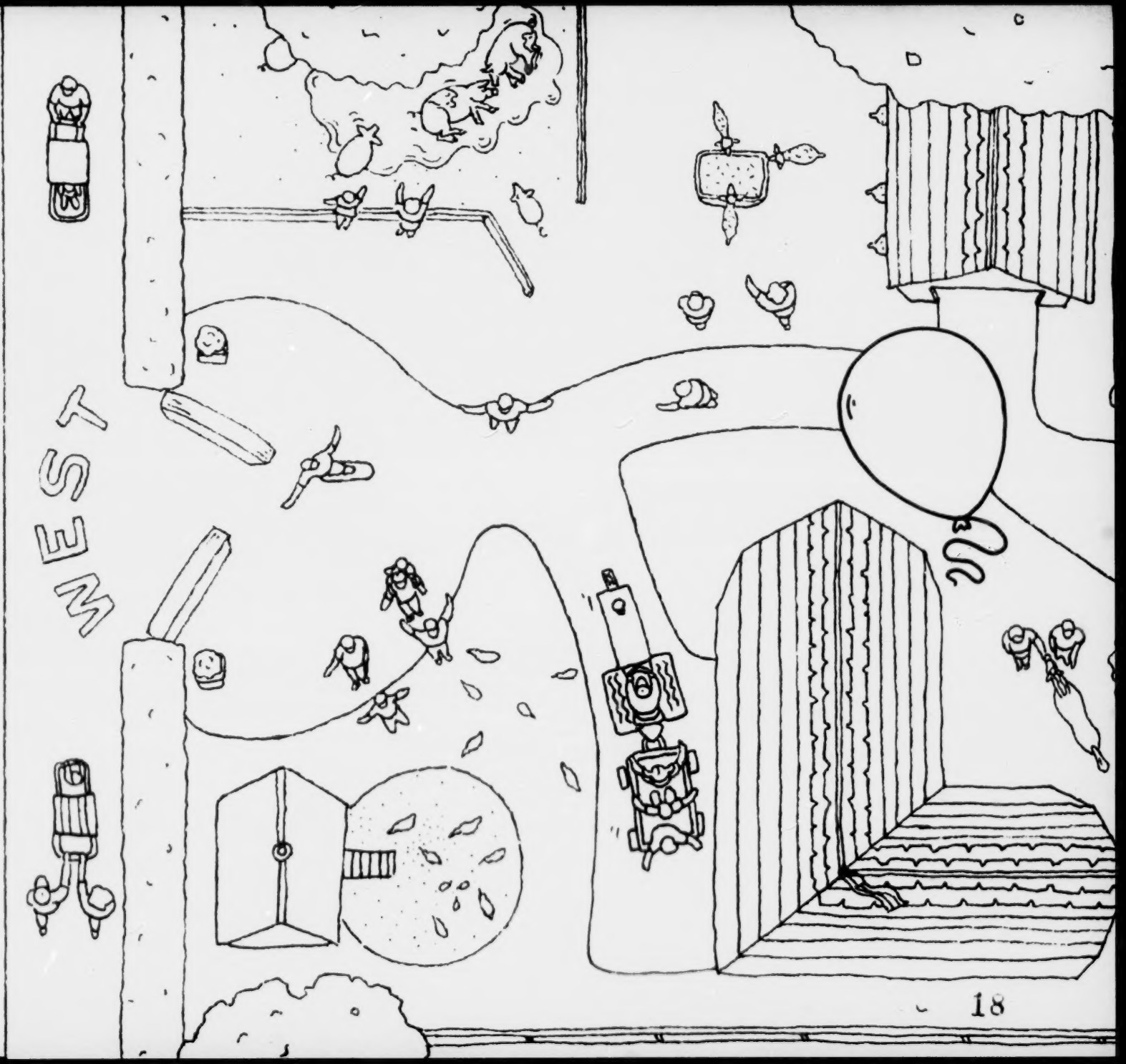

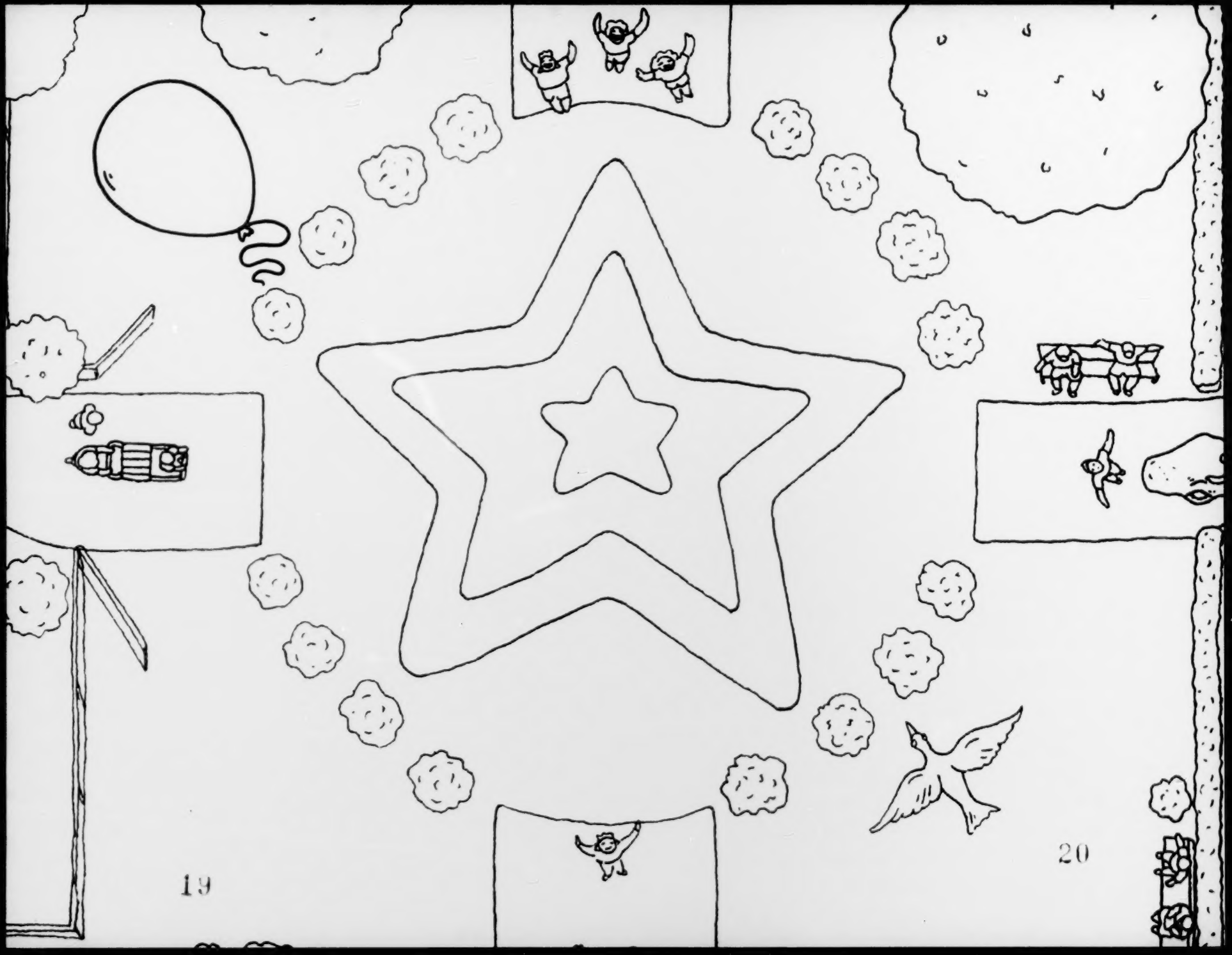

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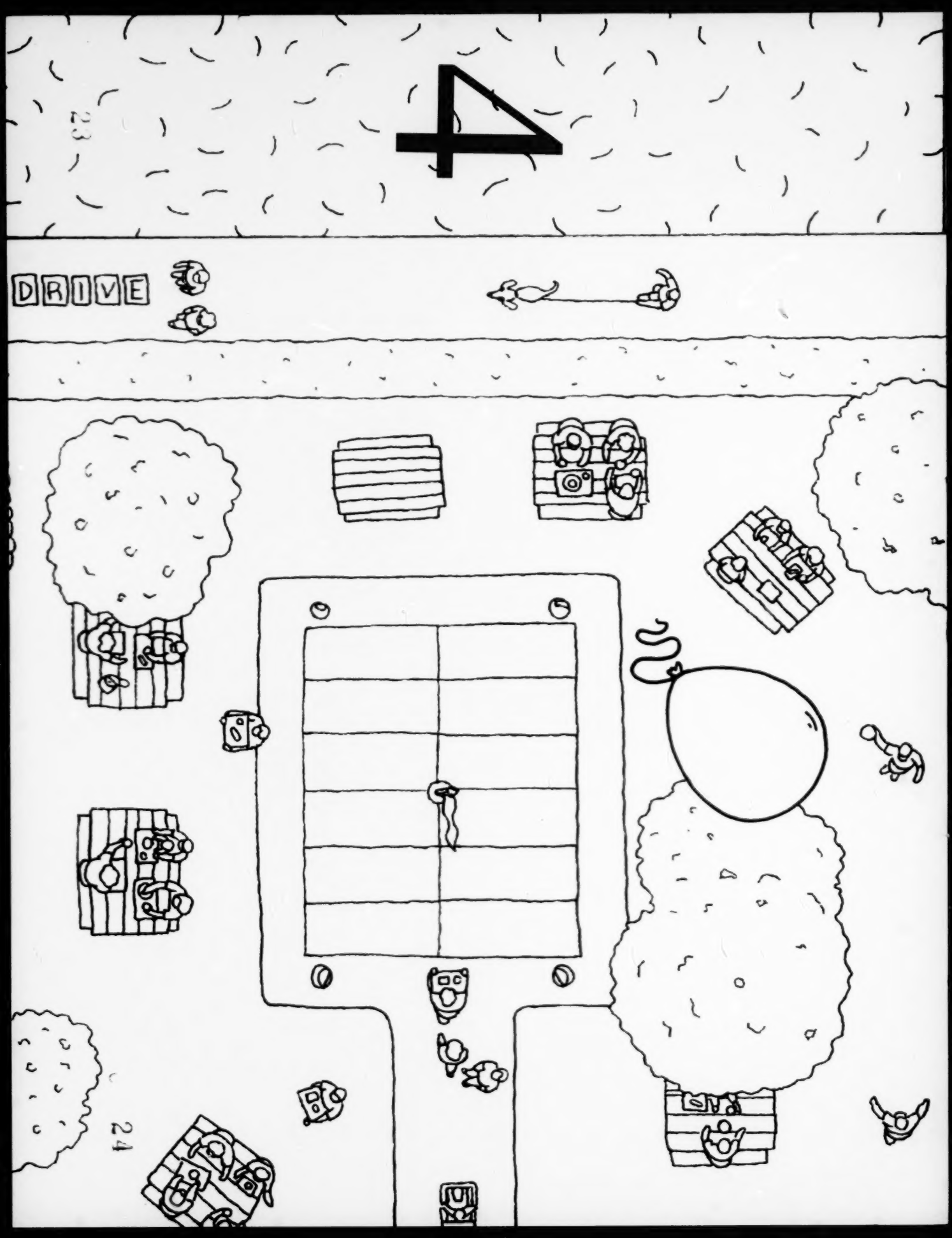
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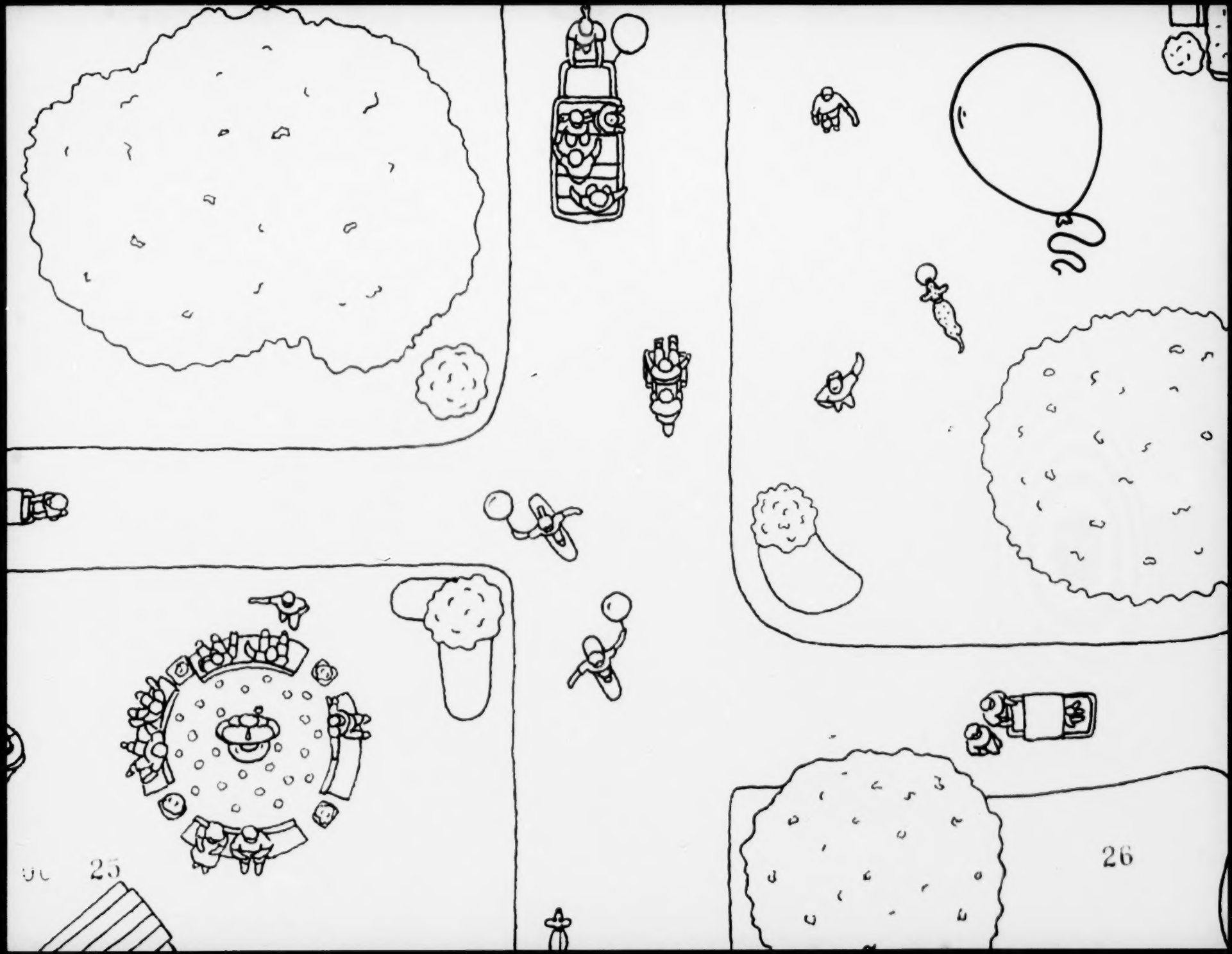

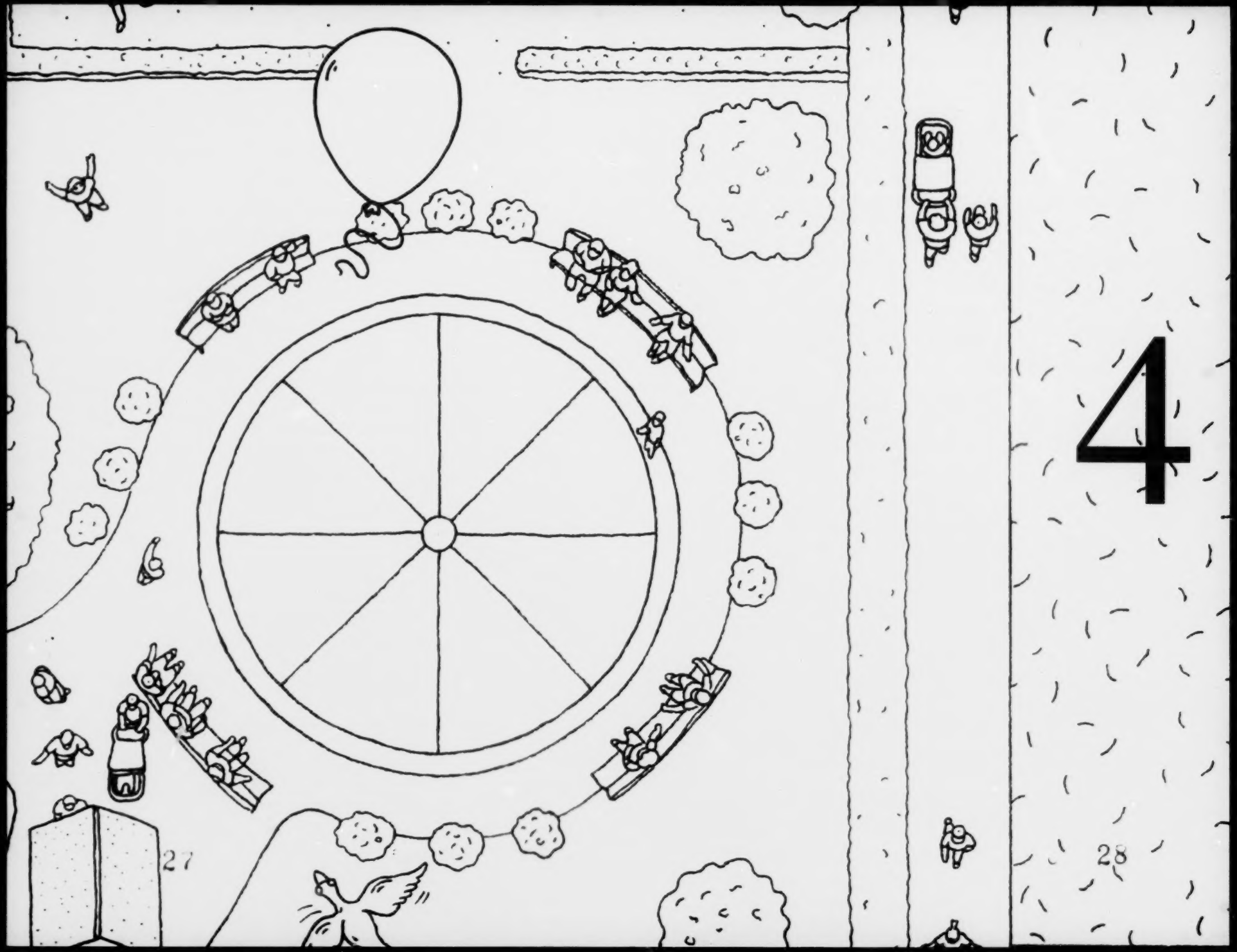
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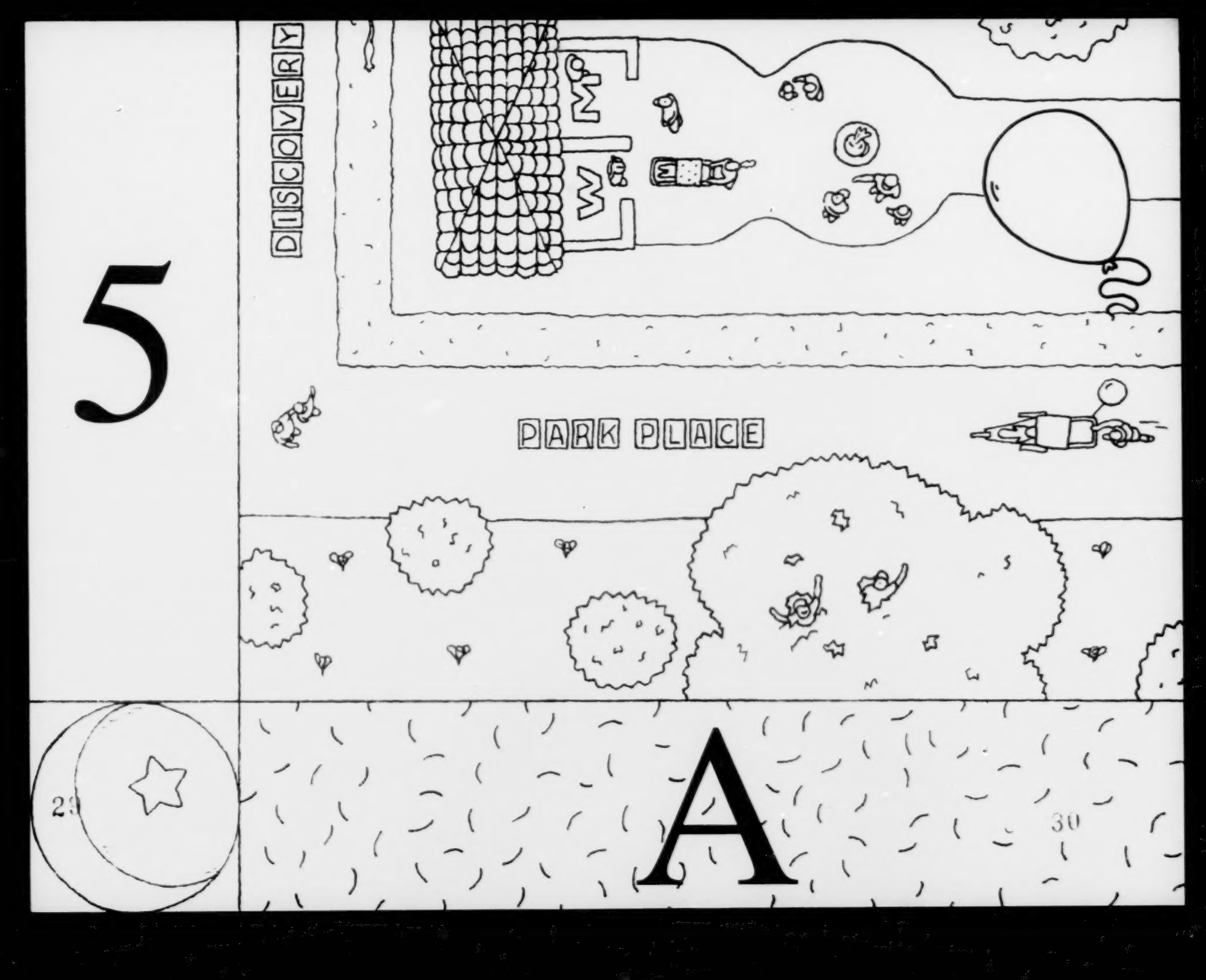
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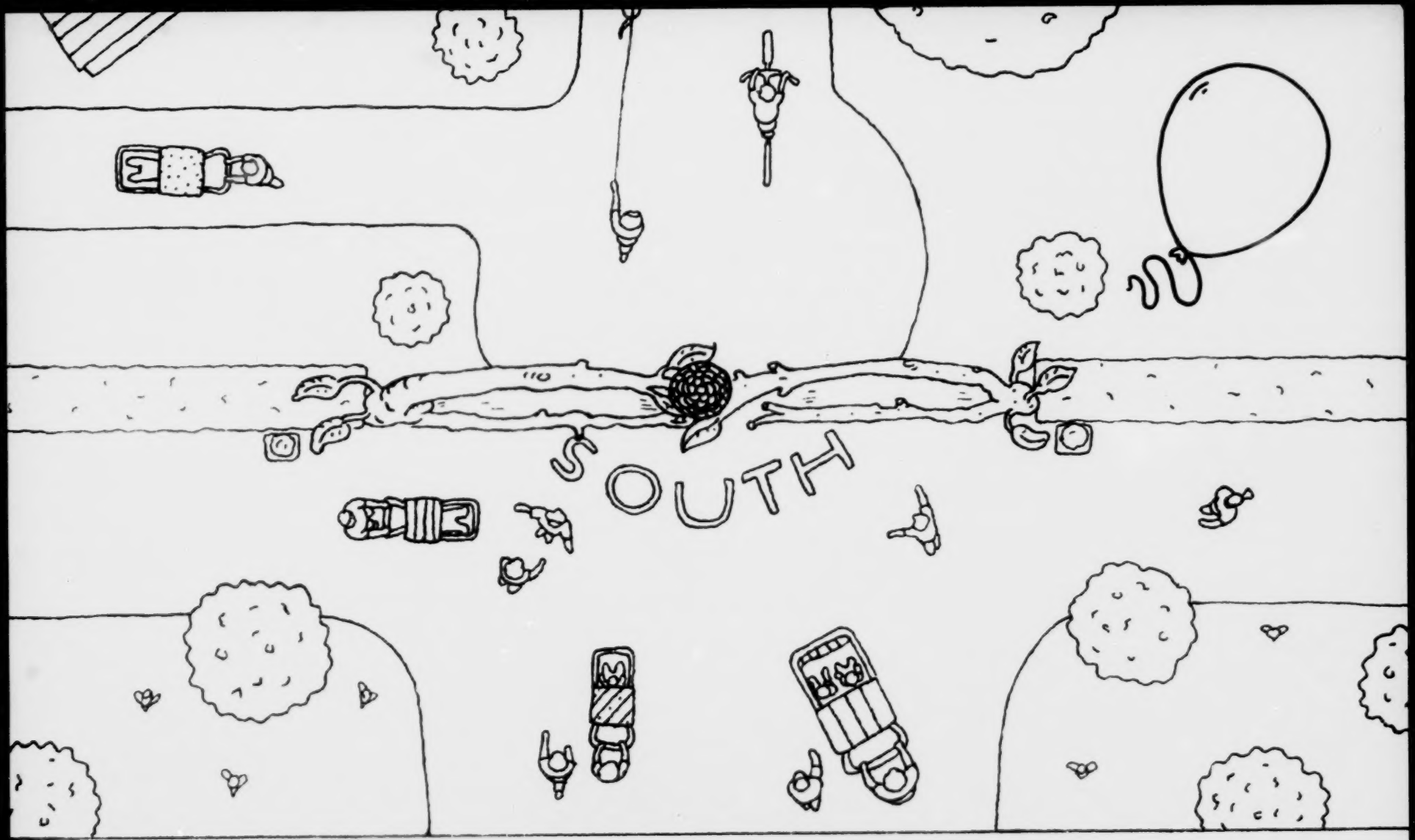

B

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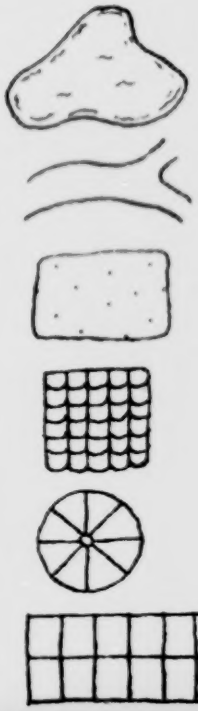
Map Adventures

Legend



Water

Path

Playground

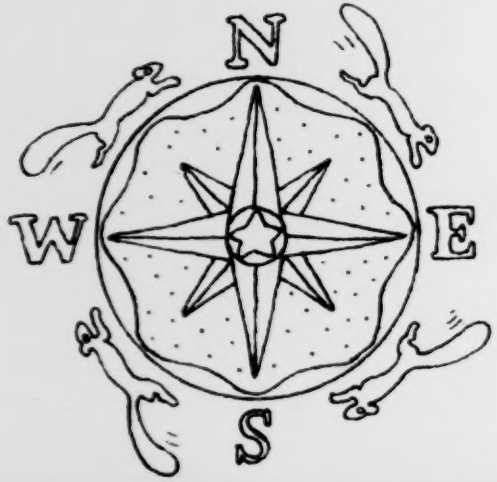
Restroom

Carousel

Food tents

Scale 1 inch = 4 feet **(1:48)**

0 **4'** **8'** **12'**



Lesson plan 1 View from the Ground

Key points

- People cannot see everything from a ground view.
- The introduction begins with an illustration showing the front of a park.

Lesson objective

- Students view a specific location from a familiar perspective (at ground level). Items observed in this view will be used as reference points when the perspective changes in the next lesson.

Materials needed for this lesson

- Illustration 1, showing the side view of a park from the ground.
- **Example for teachers** showing a photograph of a hot-air balloon.

Suggestions for teaching this lesson (25-minute lesson)

- To begin the lesson, ask the students to look at illustration 1 and make a list of what they think is in the park. The list might include:

  a playground
  a water fountain
  a flag pole
  rides

- Tell the students that you have a story about an adventure a girl has in the park and then read the tale in the story box.
- Pass out **Activity sheet 1**. The students should color in the balloons, put their name in the banner area and cut them out. When complete, have them post their balloons on the wall next to illustration 1. Have them predict what they think is going to happen next in the story.

Suggested subjects for discussion or writing exercises

- I think a good name for the park is _____, because...
- A fun park should have....(a follow-up assignment might be to draw a picture of the park the students wrote about.)
- Is there a park near our school? How might a new student find their way to this park? (A new friend might lead a walk, a police officer might provide directions, or the student might use a map.)

Lesson plan 2 View from a Higher Point

Key points

- The appearance of objects change as the view point changes.
- More objects can be seen from a higher point of view.

Lesson objective

- Students will learn how objects change in appearance depending on the perspective from which they are viewed. This prepares students to understand the overhead perspective offered by most maps.

Material needed for this lesson

- Illustration 2, showing a view of the park from above the ground.

Suggestions for teaching this lesson (30-minute lesson)

- To begin the lesson, review illustration 1 and go on to illustration 2. Initiate a discussion about the new point of view of the same park. Ask the students where Nikki is and discuss ways that a person could see a park from the same angle. One could achieve a similar view from:

  a tower
  a plane
  a tall building
  the top of a ferris wheel

- Read the second part of the tale in the story box.
- Point out the following features in illustration 1: The tree outside the park, the front gate to the park, the top of the clock, and the top of the carousel. Next, show illustration 2 and point out how these features have changed. For example, one can now see both the side and the top of these items. Note that with the tree, you now see less of the trunk and branches.

Suggested subjects for discussion or writing exercises

- Write a story about climbing a hill and what you saw when you got to the top of hill.
- Are there any tall buildings close to your school? What might you see from the top of these buildings?

Lesson plan 3 View from Overhead

Key points

- A map is a drawing, usually on a flat surface, of a part of the Earth.
- Many maps show an overhead view.
- A map is used by people to locate places on the Earth's surface.

Lesson objective

- Students will develop an understanding of the overhead view presented by most maps.

Materials needed for this lesson

- Illustration 2, showing a view of the park from above the ground.
- Illustration 3, showing a map of the park from overhead.

Suggestions for teaching this lesson (30-minute lesson)

- To begin the lesson, show illustration 3. Have the students locate the same four items as in lesson 2. Ask them how they look different in this view. From above, the trees may look like circles and the buildings like squares. Explain that although this is an unfamiliar view, it is the one used in most maps.
- Point out the rolled up map in the leather bag. Ask the students how Nikki might use the map.
- Lead a class discussion about where students have seen maps and what different uses they have.
- Tell the students you will read more about Nikki's adventure and then read the final story box.

Suggested subjects for discussion and writing exercises

- How would an overhead picture of our classroom look different than a picture from the door?
- I have seen maps in...
- Who might use maps in their work? Why would you need a map (to get to grandparents, toy store, vacation spots, etc.)?
- Draw a map of an island and describe what is located on your island.

Lesson plan 4 Symbols and Legends

Key points

- A map symbol represents a feature or object on the ground.
- A legend explains what objects or features the symbols represent.

Lesson objectives

- Students will become familiar with the concepts of symbols.
- Students will learn to use a legend to identify features on a map.

Material needed for this lesson

- Illustration 3, showing a map of the park.

Suggestions for teaching this lesson (40-minute lesson)

- To begin the lesson, reintroduce illustration 3 to the students. Explain that maps are often unable to show the same level of detail for objects or features found on the Earth as shown in illustration 3. Consequently, mapmakers often use symbols to represent some of these objects or features. For example, in a map of your city, mapmakers will not draw a separate picture of every school. Instead, they draw a square with a flag on top as a symbol of a school. Then, each school, whether it is big or small, long or narrow, will have its location marked with this same symbol. Colored symbols are often used to depict features. Features are often symbolized with the color they are associated with. For example, water features such as rivers and lakes are shown as blue; vegetation cover such as trees, shrubs, and grass are shown as green; and constructed features such as buildings and streets are shown as black.
- Explain that when we look at a map, we may be unsure of what a particular symbol represents. On a map, symbols are identified in an area called the legend. The legend often displays other important information including scale and direction.
- Point out the legend in the illustration. Have the students identify what information this legend shows them. Go over each symbol and have the students find it on the map. Ask the students if they can identify the circle with the red and white triangular shapes? What is the rectangle with the blue and white shapes? If they didn't know the other part of the story and see the other illustrations, could they still identify the carousel and snack-bar? What else could they have been? A tent? A big blanket?
- Ask the students to find things in the illustration that are not on the legend. Explain to them that only a permanent feature or object on the ground would be included on a map. Consequently, things such as the animals or people would not be included on a map or in the legend.

Extended activity

- Have the students draw maps covering several blocks of area around the school or their home. Encourage them to develop their own symbols and to use them where appropriate. For example, create a symbol for a house and use it for all houses in the area. The maps should be limited to permanent features (no dogs, cats, cars, people, etc.) and show an overhead view.

Lesson plan 5 Learning Directions on a Map

Key points

- Maps use the directions north, south, east, and west to help locate objects or features.
- Many maps have a compass or a small drawing in the legend to help identify the directions north, south, east, and west.

Lesson objective

- Students will learn to use north, south, east, and west to identify relative locations and provide directions.

Material needed for this lesson

- Illustration 3, showing a map of the park.

Suggestions for teaching this lesson (40-minute lesson)

- Explain to the students that a direction is the point toward which something faces. For example, when you ask all the students to face forward, forward is a direction. Also, when you ask everyone to look up, up is a direction.
- Explain to students that north is at the top on most maps. Put illustration 3 on the floor with north oriented properly. Have the students sit around the illustration. Point out the star located in the center. Demonstrate how directions such as "forward," "up," "right," etc., are ineffective when trying to plan movement on a map. To walk over to the dinosaur slide, students on one side might say "move right," while students on the opposite side will say "move left." Explain how maps use a much more effective set of directions: north, south, east, and west. West is the direction in which the sun sets. When facing west, north is to the right, south is to the left, and east is behind.
- Show the students where north, south, east, and west are marked on the illustration. Demonstrate to the students that to walk over to the dinosaur from the star, one would have to go east. Ask them which direction you would walk to go over to the barn? (west)
- Introduce the idea of directions between two points. Point out that not everything is directly north, south, east, and west of another point. Introduce students to additional directions—northeast, southeast, southwest, and northwest. Ask the students if they were standing on the star and looking at the carousel, what direction they would be looking? (southeast) Ask the students to help Nikki's mother get to the pasture where Nikki landed the balloon. Choose different locations on the map where Nikki's mother might be, then ask questions about which direction she would travel to go from that location to the pasture.
- Talk about relative location. Explain how we can use north, south, east, and west to talk about where one place on a map is in relationship to another. Demonstrate to the students that one place is north of another. Do the same for south, east, and west. Examples: the bridge is _____ of the dinosaur (north); the food tent is _____ of the carousel (west).

Suggested subjects for discussion and writing exercises.

- Reproduce **Activity sheet 2** for each discussion and student. Have them select a site for a picnic in the park and mark the location with an X. The students should then provide (north, south, east, west) directions for someone at the north gate to get to the picnic site. For example, go south to the first path. Turn east and continue to the tower. At the tower turn south and meet me under the tree! Next, have students note the relative position of the picnic site to the star in the center. In our example, the picnic site is northeast of the star.

Lesson plan 6 Map Grids

Key points

- By using a grid of imaginary lines, it is possible to identify the absolute location of any point on the Earth's surface.
- Grids, like directions, help to identify the location of objects or features on a map.

Lesson objective

- Students will learn how grids are created and used to locate positions of objects or features on a map.

Materials needed for this lesson

- Illustration 3, showing a map of the park.
- The fifteen black-and-white sections of illustration 3.
- Four 60-inch strings.

Suggestions for teaching this lesson (35-minute lesson)

- Begin by telling the students that a grid is a network of evenly spaced horizontal and vertical lines. Do this while drawing a simple grid of five horizontal and five vertical lines on the chalkboard. Explain that maps use similar grids to help locate specific places or objects.
- Place illustration 3 on the floor. Have the students sit on the floor or in chairs on the south side. Point out the numbers 1, 2, 3, 4, and 5 on the left side; also, point out the letters A, B, and C along the top. Explain that each letter or number identifies a section of the map.
- Using string, run lines from top to bottom midway between letter A and letter B. Do the same midway between letter B and letter C. This identifies section B on the map. Now do the same at midway between number 2 and number 3 and again midway between number 3 and number 4. This identifies section 3 on the map. The space that is framed by the four lines is called B3. Tell the students they could identify the location of the star by giving these coordinates (B3). Continue framing different sections until students have a working understanding of the activity. Note that each section of the grid has its own letter-number label, such as A2, C1, and B5.
- Students are now ready to identify the absolute location of certain features by section letter and number.

Suggested subjects for discussion and writing exercises

- Recall in the story that Nikki landed the balloon in the pasture near the barnyard. Ask the students to identify the location of the landing area by giving the letter-number coordinates (A2).
- Have students choose any section they want. They should list its letter-number coordinates and write about what they see inside.

Lesson plan 6 is continued on the reverse.

Lesson plan 6 Map Grids (continued)

Reinforcement activity

- Reproduce the 15 sections of the black-and-white map illustration.
- Randomly place the pages on the floor around illustration 3. Call out the name of a section from illustration 3. Ask a student to find the page showing that section. They should then write the letter-number coordinates in the balloon and place the page on the third illustration. Continue this activity until all of illustration 3 is covered.
- Using the map on **Activity sheet 2** have the students locate and list the letter-number coordinates of the following features: the island, the statue, the tractor, the picnic benches, and the rest rooms.

Lesson plan 7 Map Scale

Key point

- The scale of the map is the relationship between a distance on the map and actual distance on the ground.

Lesson objectives

- Students will learn about scale and what it does.
- Students will learn how to use the scale on a map to determine distance and to measure the size of objects.

Materials needed for this lesson

- Illustration 3, showing a map of the park.
- Paper and pencil.

Suggestions for teaching this lesson (35-minute lesson)

- Begin by asking the students if illustration 3 shows the park in its actual size. The answer, of course, is no. Explain that the size of the park and everything inside has been proportionately reduced to fit on this paper. To find out how much smaller this illustration or a map is than the actual area on the ground, we refer to the scale. The scale **on** a map is usually located in the legend.
- Continue the discussion by telling the students that the scale **of** a map is in proportion to the area it represents. In illustration 3 the proportion is 1 to 48. Tell the students this means that 1 inch on the map represents 48 inches on the ground.
- Point out the scale in the legend of the map (illustration 3). Students will see that the distance of 1 inch on the scale is marked as equaling 4 feet on the ground. [You may want to show the students that multiplying four (the number of feet) by twelve (the number of inches in a foot), equals forty-eight (inches).
- Explain to the students that one reason people use maps is to find the distance between two places. Demonstrate how they can use the scale to measure the length of objects in the park and the distance between two points. Take a piece of paper and follow the path between two points, marking lines on the edge of the paper until you have marked the total distance. Take the paper and count how many times the scale will go along the marked line on the paper. Use repeated addition or multiplication to determine the distance.
- Have the students use the scale to determine the distance Nikki's mother would have to walk to get to the pasture where Nikki landed. Have Nikki's mother stand at different areas of the park and let the students develop a list of distances between these areas and the pasture. For example, how far is it from the south gate to the pasture? How far is it from the carousel to the pasture? How far is it from the bridge to the pasture?

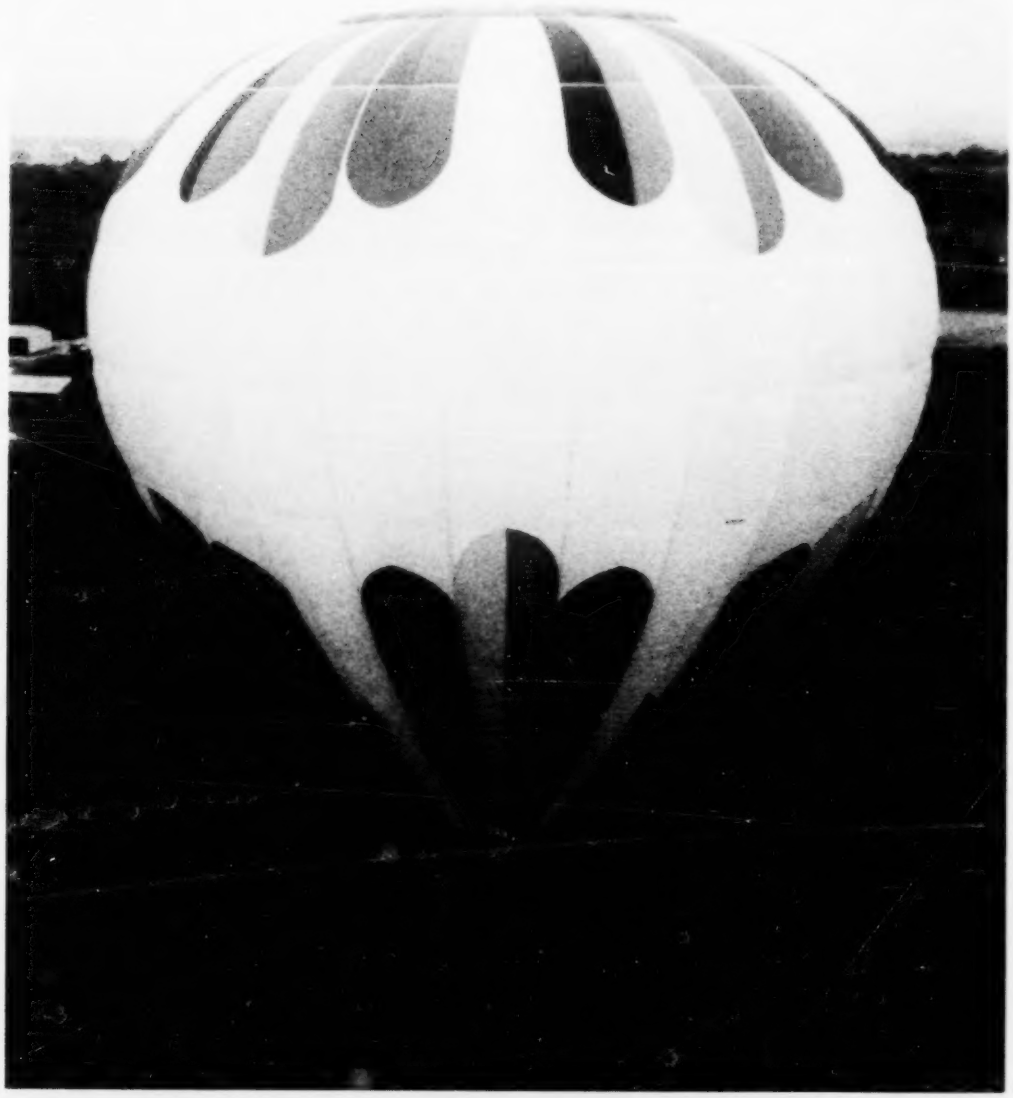
Extended activities

- Select a few of the items found in the illustration. Have the students use the scale to determine the size of these features. Next, help them draw the outline of the selected features, at their actual size, on your school playground. You can use string, chalk or another material to mark the outlines.

Activity sheet **1** Cut and color

Activity sheet **2** View from Overhead

Example for teachers



A hot-air balloon floats high above the ground.

Evaluation of *Map Adventures*

So that we can improve our educational products, we would appreciate your response.
Please return this evaluation sheet to: U.S. Geological Survey, National Mapping Division,
Branch of Publications and Product Policy, 508 National Center, Reston, VA 22092.

How did you receive this teaching packet? _____

In which geographic area is the school located? **(circle one)** urban rural suburban

Grade level of class _____ Number of students _____

1. Please rate the materials in the packet:
(0=difficult to use; 1=adequate; 2=excellent)

   - ☐ poster
   - ☐ teacher information
   - ☐ lesson plans
   - ☐ activity sheets
   - ☐ folder

2. With my class I used

   - ☐ the poster
   - ☐ the lesson plans
   - ☐ the activity sheets

3. The concepts presented were

   - ☐ too simple
   - ☐ appropriate
   - ☐ too difficult (explain)

   _____

   _____

4. The materials in this packet

   - ☐ did not help students grasp the concepts
   - ☐ helped most students understand the concepts
   - ☐ are an excellent teaching tool
   - ☐ other _____

   _____

5. The most useful part of this packet is

   - ☐ the poster
   - ☐ the lesson plans
   - ☐ the activity sheets

6. The least useful part of this packet is

   - ☐ the poster
   - ☐ the lesson plans
   - ☐ the activity sheets

7. Suggestions to improve this packet

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8. Additional comments

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9. School name and address (optional)

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